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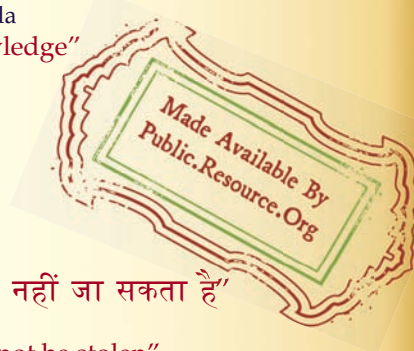
IS 2483 (1986): Ticket board [CHD 15: Paper and its products]



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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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Indian Standard

SPECIFICATION FOR TICKET BOARD

(First Revision)

UDC 676.818

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BUREAU OF INDIAN STANDARDS

MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG

NEW DELHI 110002

July 1987

**AMENDMENT NO. 5 SEPTEMBER 2008
TO
IS 2483 : 1986 SPECIFICATION FOR TICKET BOARD**

(First Revision)

(Page 5, clause 3.6, read with Amendment No. 1) — Substitute
**'Additional Requirements for ECO Mark' for 'Optional Requirements for
ECO Mark'.**

(CHD 15)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 4 SEPTEMBER 2005
TO

IS 2483:1986 SPECIFICATION FOR TICKET BOARD

(First Revision)

(Page 4, clause 3.4, read with Amendment No. 2) — Substitute the following for the existing

‘3.4 Grammage — Mass of paper or board in grams per square metre after conditioning under standard atmospheric conditions of $27 \pm 2^{\circ}\text{C}$ temperature and 65 ± 2 percent relative humidity.

3.4.1 The nominal grammage of the ticket board shall be as agreed to between the buyer and the supplier. A tolerance of ± 5 percent shall be permitted on the nominal grammage, when tested in accordance with 6 of IS 1060 (Part 1) : 1966*.’

(CHD 15)

AMENDMENT NO. 3 AUGUST 2004
TO
IS 2483 : 1986 SPECIFICATION FOR TICKET BOARD
(First Revision)

[Page 8, clause A-3 (see also Amendment No. 2)] — Substitute the following for the existing :

'A-3 CALCULATION AND EXPRESSION OF RESULTS

A-3.1 Calculate the arithmetic mean of the twenty readings and express the stiffness in Newtons to three significant figures. For instruments giving readings of stiffness in grams-force the result may be expressed as stiffness in Newtons by multiplying the reading in grams-force by 9.81×10^{-3} . For instruments giving readings as values of bending moment in grams-force centimetres (sometimes called 'units' or 'Taber units') the result may be expressed as stiffness in Newtons by multiplying the units figure by 9.81×10^{-3} and dividing by the bending length in centimetres. For the most accurate work the effect of the precise bending length used on the stiffness shall be taken into account.

Hence,

$$\text{Stiffness index} = \frac{S \times 10^3}{g^3}$$

where

S = stiffness in N, and

g = grammage, g/m^2 .

(CHD 15)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 2 MAY 2003 TO IS 2483 : 1986 SPECIFICATION FOR TICKET BOARD (First Revision)

(Page 3, clause 2.1) — Substitute the following for the existing:

'2.1 For the purpose of this standard, the definitions given in IS 4661: 1999† and the following shall apply.'

(Page 3, footnote marked '†') — Substitute the following for the existing:

†Glossary of terms used in paper trade and industry (second revision) '.

(Page 4, clause 3.2, line 3) — Substitute '4, 5, 6 and T for '4, 5 and 6'.

(Page 4, clause 3.4) — Substitute the following for the existing:

'3.4 Grammage — Mass of paper or board in grams per square metre after conditioning under standard atmospheric conditions of $27 \pm 2^\circ\text{C}$ temperature and 65 ± 2 percent relative humidity.'

[Page 5, Table 1, Sl No. (v), col 2 and 3] — Substitute the following for the existing:

SI No.	Characteristic	Requirement
(1)	(2)	(3)
v)	Stiffness index, Nm^6/kg^3 , Min:	
	a) Machine direction	
	b) Cross direction	10 3.5'

[Page 5, clause 4.2(c)] — Substitute 'Grammage' for 'Substance'.

(Page 8, clause A-3) — Substitute the following for the existing:

$$\text{'Stiffness Index} = \frac{S \times 10^3}{g^3}$$

where

S = stiffness in N, and

g = grammage, g/m^2 .

(CHD 15)

AMENDMENT NO. 1 JULY 1993
TO
IS 2483 : 1986 SPECIFICATION FOR TICKET BOARD
(First Revision)

(Page 3, clause 0.4) — Add this new clause after clause 0.3 and renumber the subsequent clauses:

"0.4 A scheme for labelling environment friendly products known as ECO Mark has been introduced at the instance of the Ministry of Environment and Forests (MEF), Government of India. The ECO Mark would be administered by the Bureau of Indian Standards (BIS) under the BIS Act, 1986 as per the Resolutions No. 71 dated 21 February 1991 and No. 425 dated 28 October 1992 published in the Gazette of the Government of India. For a product to be eligible for marking with ECO logo, it shall also carry the  Mark of BIS besides meeting additional optional environment friendly requirements. For this purpose, the Standard Mark of BIS would be a single mark being a combination of the  Mark and the ECO logo. Requirements to be satisfied for a product to qualify for the BIS Standard Mark for ECO friendliness, will be included in the relevant published Indian Standards through an amendment. These requirements will be optional; manufacturing units will be free to opt for the  Mark alone also.

This amendment is based on the Gazette Notification No. 455 dated 13 November 1992 for paper as environment friendly products published in the Gazette of India. This amendment is, therefore, being issued to this standard to include environment friendly requirements for base paper for sensitized paper".

(Page 5, clause 3.6) — Add the following new clause after clause 3.5:

"3.6 Optional Requirements for ECO Mark

3.6.1 General Requirements

3.6.1.1 The product shall conform to the requirements for quality and performance prescribed under clauses 3.1 to 3.5.

3.6.1.2 The manufacturer shall produce to BIS, the environmental consent clearance from the concerned State Pollution Control Board as per the provisions of Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981 along with the authorisation, if required, under the Environment (Protection) Act, 1986, and the rules made thereunder, while applying for ECO Mark.

3.6.2 Specific Requirements

3.6.2.1 The material shall be of the following two types depending on the raw material used in the manufacture:

- a) *Type A* — Manufactured from pulp containing not less than 60 percent by mass of pulp made from materials other than bamboo, hard woods, soft woods and reed.
- b) *Type B* — Manufactured from pulp made from 10 percent waste paper."

(*Page 5, clause 4.1.1*) — Add the following new clause after clause **4.1**:

"**4.1.1** For ECO Mark, the product shall be packed in such packages which shall be recyclable/reusable or biodegradable."

(*Page 6, clause 4.2.2*) — Add the following new clause after clause **4.2.1**:

"**4.2.2** For ECO Mark, following additional information may also be marked on the container/package:

"The criteria for which the product has been labelled with ECO Mark."

Indian Standard

SPECIFICATION FOR TICKET BOARD

(First Revision)

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Indian Standard

SPECIFICATION FOR TICKET BOARD

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 8 December 1986, after the draft finalized by the Paper and Its Products (Excluding Packaging Materials) Sectional Committee had been approved by the Chemical Division Council.

0.2 Ticket board is being used in increasing quantities for the manufacture of railway tickets and for use in the automatic weighing machines. It is expected that this standard will assist the manufacturers to control the quality of their products and the consumers to obtain material of proper quality.

0.3 This standard was originally published in 1963 and was based on data obtained from Government of India, Stationary Office, Calcutta and the Forest Research Institute and Colleges, Dehra Dun. The standard is being revised in view of recent technological developments. In this revision, the method for the determination of stiffness has been changed and SI units have been prescribed.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements, and methods of sampling and test for board, white or coloured, simplex, duplex and triplex used for tickets.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given in IS : 4661-1986† and the following shall apply:.

*Rules for rounding off numerical values (revised).

†Glossary of terms used in paper trade and industry (revised).

2.1.1 Bending Force — The force in Newtons necessary to deflect a rectangular test piece, clamped at one end, through a bending angle of 15° when the force is applied near to the free end of the test piece, normal to the plane which, includes the near edge of the test piece clamp and the point or line of application of the force.

2.1.2 Bending Length — The constant radial distance between the clamp and the position on the test piece at which the force is applied.

2.1.3 Bending Angle — The angle between the initial plane of the test piece and the plane passing through the line of clamping and the line of application of force at the end of the test.

2.1.4 Free Length — The initial length of the test piece that projects from the clamps.

3. REQUIREMENTS

3.1 General

3.1.1 The board shall be uniform in thickness, free from hard spots and lumps, shall be flat and shall not delaminate when slit or punched. Both sides shall be clean and smooth and of even finish and colour. The colour shall be as agreed to between the buyer and the supplier.

3.1.2 Sheets shall be cut clean and square to the specified dimensions. All cut edges shall be free from loose fibres and dust. If ordered in reel, care should be taken in reeling so that the surfaces at either end of the reel are in one plane.

3.2 The board shall comply with the requirements given in Table 1, when tested in accordance with the relevant test method prescribed in column 4, 5 and 6 of Table 1.

3.3 Thickness — The thickness of the board shall be as agreed to between the buyer and the supplier. When tested in accordance with 7 of IS : 1060 (Part 1)-1966*, the following tolerances shall be allowed on the declared thickness:

<i>Declared Thickness</i>	<i>Tolerance</i>
Up to 500 micrometres	± 20 micrometres
501 micrometres and above	± 30 micrometres

3.4 Substance — The substance of the ticket board shall be as agreed to between the buyer and the supplier. A tolerance of ± 5 percent shall be

*Methods of sampling and test for paper and allied products, Part 1 (revised).

TABLE 1 REQUIREMENTS FOR TICKET BOARD

(Clause 3.2)

SL No.	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST REF TO CL NO. IN			
			IS : 1060 (Part 1) -1966*	IS : 1060 (Part 2) -1960†	IS : 1060 (Part 3) -1960‡	Appendix
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Burst index, kPa, m ² /g, <i>Min</i>	1.00	12.5	—	—	—
ii)	pH (both sides)	5.0 to 6.5	10	—	—	—
iii)	One minute cobb test both sides, <i>Max</i>	40	13.2.2	—	—	—
iv)	Brightness (for white boards only), <i>Min</i>	60	—	13	—	—
v)	Stiffness, mN, <i>Min</i>		—	—	—	A
	a) Machine direction	1 055				
	b) Cross direction	560				
vi)	Wax pick number (both sides)	6A	—	—	8	—

*Methods of sampling and test for paper and allied products, Part 1 (revised).

†Methods of sampling and test for paper and allied products, Part 2.

‡Methods of sampling and test for paper and allied products, Part 3.

permitted on the nominal substance, when tested in accordance with 6 of IS : 1060 (Part 1)-1966*.

3.5 Size — The sizes and tolerance on sizes shall be in accordance with IS : 1064-1980†, unless otherwise agreed to between the buyer and the supplier.

4. PACKING AND MARKING

4.1 The board shall be securely and suitably packed as agreed to between the buyer and the supplier.

4.2 Each package shall be marked with the following particulars:

- Description of the material and colour;
- Size of the board;
- Thickness in micrometres or substance in g/m²;
- Number of sheets (in the package) and net mass of the contents;
- Batch number;
- Month and year of manufacture; and
- Name of manufacturer and trade-mark, if any.

*Methods of sampling and test for paper and allied products, Part 1 (revised).

†Specification for paper sizes (second revision).

4.2.1 Each package may also be marked with the Standard Mark.

NOTE — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act 1986 and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

5. SAMPLING

5.1 The paper shall be sampled in accordance with 3 of IS : 1060 (Part 1)-1966*.

APPENDIX A

[Table 1, Sl No. (v)]

TEST FOR STIFFNESS

A-0. OUTLINE OF THE METHOD

A-0.1 Measurement of the force required to bend a test piece clamped at one end through a given angle; the force is applied at a constant distance from the line of clamping.

A-1. APPARATUS

A-1.1 Any system may be used that is capable of acting on the test piece to measure the bending force to a degree of precision in accordance with the specification for instrument accuracy.

A-1.2 The clamp should grip the test piece across its full width and along its length for a distance of not less than 12.7 mm when test pieces are inserted. The test piece should not be restrained at the free end except by the friction imposed by the surface of the free end of the test piece on the indicating or recording mechanism.

A-1.3 The nominal bending length is 50 mm. This bending length allows the use of several types of instruments that have been found satisfactory. For the most accurate work, however, the results shall be corrected for differences in the nominal bending length.

*Methods of sampling and test for paper and allied products, Part 1 (revised).

A-1.4 The instrument employed shall comply with the following requirements within the given limits of accuracy:

- a) Bending angle 15 ± 0.1 ,
- b) Bending length $50 \pm QJ$ mm,
- c) Test piece width 38 ± 0.2 mm,
- d) Rate of bending such that a bending angle of 15° is reached in not less than 3 seconds and not more than 20 seconds. It is essential that bending during the test is continuous and the rate of bending should be reasonably constant, and
- e) Scale readings accurate to ± 2 percent on the appropriate range.

A-1.5 Equipment for the cutting of the test piece to the required accuracy is also required. This may consist of a knife and template, a guillotine or a punch.

A-2. PROCEDURE

A-2.1 Select units and sheets and take specimens according to 3 of IS : 1060 (Part 1)-1966*.

A-2.2 The sample shall be conditioned in accordance with 5 of IS : 1060 (Part 1)-1966*, and sample preparation and testing shall be carried out in the conditioning atmosphere specified.

A-2.3 Cut test pieces of 38 ± 0.2 mm width and 75 ± 5 mm length. A minimum number of ten test pieces is required in each test direction. There shall be no folds, creases, visible cracks or other defects on the area to be tested and the test piece shall not include any part of the sample that is less than 15 mm from the edge of the test sheet or reel. If watermarks are present, this should be stated in the test report.

NOTE — When testing the machine direction or cross direction stiffness of the board, the appropriate direction is perpendicular to the width of the test piece.

A-2.4 Carry out the operations involved in the measurement of stiffness of each test piece in the manner recommended for the type of instrument in use.

A-2.5 Insert the test piece in the clamp in such a manner that the length that projects from the clamp (the free length) is 57 ± 3 mm and the test piece is correctly aligned.

A-2.6 The standard bending angle is 15° .

*Methods of sampling and test for paper and allied products, Part 1 (revised).

A-2.7 Deflect each test piece through an angle of 15° to one side of the unstressed position and then immediately return the test piece through the zero position and deflect it through an angle of 15° to the other side of the unstressed position. In each direction take the reading as soon as 15° deflection has been reached. Should the instrument be so designed that deflection is possible to one side only of the unstressed position, then equal numbers of test pieces with opposing surfaces towards the direction of deflection should be tested. No test piece shall be re-used after it has been removed from the instrument clamp.

A-2.8 When each test piece is deflected to both sides of the unstressed position, ten test pieces and twenty readings are required. For instruments in which each test piece is deflected to only one side of the unstressed position twenty test pieces and twenty readings are required. Where a distinct partial fracture or considerable permanent deformation of the test piece occurs during a test, the results of this test shall be ignored.

A-3. CALCULATION AND EXPRESSION OF RESULTS

A-3.1 Calculate the arithmetic mean of the twenty readings and express the stiffness in newtons to three significant figures. For instruments giving readings of stiffness in grams-force the result may be expressed as stiffness in newtons by multiplying the reading in grams-force by 9.81×10^{-3} . For instruments giving readings as values of bending moment in grams-force centimetres (sometimes called 'units' or 'Taber units') the result may be expressed as stiffness in newtons by multiplying the units figure by 9.81×10^{-3} and dividing by the bending length in centimetres. For the most accurate work the effect of the precise bending length used on the stiffness shall be taken into account.

Hence,

$$\text{Stiffness} = \frac{L^2}{2500} \times \text{measured bending force}$$

where

L = bending length in mm.

A-4. TEST REPORT

A-4.1 The test report shall include the following particulars:

- a) Description and identification of the material tested,
- b) The type of instrument used,
- c) The direction of the test,
- d) The number of replicate tests carried out if other than ten (or twenty), and
- e) The mean stiffness in millinewtons or newtons to three significant figures.

(Continued from page 2)

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INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

<i>Quantity</i>	<i>Unit</i>	<i>Symbol</i>
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

<i>Quantity</i>	<i>Unit</i>	<i>Symbol</i>
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

<i>Quantity</i>	<i>Unit</i>	<i>Symbol</i>	<i>Definition</i>
Force	newton	N	1 N = 1 kg.m/s ²
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.S
Flux density	tesla	T	1 T = 1 Wb/m ²
Frequency	hertz	Hz	1 Hz = 1 c/s(s ⁻¹)
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m ²

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